

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: DOBBS et al. Patent Application
Application No.: 10/777,505 Group Art Unit: 2836
Filed: February 11, 2004 Examiner: Amaya, Carlos David.
For: POWER DISTRIBUTION SYSTEM UTILIZING REDUNDANT AC SOURCES
OR DC SOURCES

Table of Contents

	<u>Page</u>
Real Party in Interest	1
Related Appeals and Interferences	2
Status of Claims	3
Status of Amendments	4
Summary of Claimed Subject Matter	5
Grounds of Rejection to Be Reviewed on Appeal	8
Argument	9
Conclusion	16
Appendix - Clean Copy of Claims on Appeal	17
Appendix – Evidence Appendix	20
Appendix – Related Proceedings Appendix	21

I. Real Party in Interest

The assignee of the present invention is Hewlett-Packard Development Company,
L.P.

II. Related Appeals and Interferences

There are no related appeals or interferences known to the Appellants.

III. Status of Claims

Claims 1-3, 6-8 and 12-17 remain pending in the instant application. Claims 1-3, 6-8 and 12-17 are rejected. Claims 4, 5 and 9-11 are cancelled. This Appeal involves Claims 1-3, 6-8 and 12-17.

IV. Status of Amendments

All proposed amendments have been entered. An amendment subsequent to the Final Office Action mailed April 10, 2009, has not been filed.

V. Summary of Claimed Subject Matter-

As recited in Claim 1, “[a] power distribution system” is described. This embodiment is depicted at least in Figures 1-9. With reference to Figure 1, “[t]he power distribution system 10 there illustrated includes a plurality of 25 loads 12, 14, 16, 18, 20, and 22 and a plurality of sources 24, 26, 28, 30, 32, and 34. The system 10 further includes an interconnect arrangement 36 which connects the loads to the sources” ([20]). “The interconnect arrangement 36 comprises a plurality of interconnects. The interconnects connect each load to a given number of the sources so that each load is fully powered and if anyone source fails, all loads remain fully powered. To that end, it will be noted that load 12 is coupled to source 24 and source 26. Load 14 is also coupled to source 24 and source 26. Similarly, each of loads 16 and 18 is coupled to source 28 and source 30. Also similarly, each of loads 20 and 22 is coupled to source 32 and source 34” ([26]). Moreover, the instant specification recites “[e]ach of the loads and sources may be configured for placement into a standard 19 inch rack. Further, each of the sources and loads may have a height dimension in U increments to enable efficient use of each rack” ([39]).

As recited in Claim 13, “[a] power distribution system” is described. This embodiment is depicted at least in Figures 1-9. With reference to Figure 1, “[t]he power distribution system 10 there illustrated includes a plurality of 25 loads 12, 14, 16, 18, 20, and 22 and a plurality of sources 24, 26, 28, 30, 32, and 34. The system 10 further includes an interconnect arrangement 36 which connects the loads to the sources” ([20]). “As a result from the foregoing, anyone of the power sources 24, 26, 28, 10 30, 32, and 34 may fail and each of the loads 12, 14, 16, 18, 20, and 22 will remain fully powered. The power distribution system configuration of FIG. 1 hence provides reliability and continuous power to the loads. In addition, anyone power source within a single subsystem can fail and the loads will remain

fully powered” ([28]). “The interconnect arrangement 36 comprises a plurality of interconnects. The interconnects connect each load to a given number of the sources so that each load is fully powered and if anyone source fails, all loads remain fully powered. To that end, it will be noted that load 12 is coupled to source 24 and source 26. Load 14 is also coupled to source 24 and source 26. Similarly, each of loads 16 and 18 is coupled to source 28 and source 30. Also similarly, each of loads 20 and 22 is coupled to source 32 and source 34” ([26]). Moreover, the instant specification recites “[e]ach of the loads and sources may be configured for placement into a standard 19 inch rack. Further, each of the sources and loads may have a height dimension in U increments to enable efficient use of each rack” ([39]).

As recited in Claim 14, “[a] method of distributing full power to each one of a plurality of loads, each load operable to be mounted in a rack location” is described. This embodiment is depicted at least in Figures 1-9. With reference to Figure 1, “[t]he power distribution system 10 there illustrated includes a plurality of 25 loads 12, 14, 16, 18, 20, and 22 and a plurality of sources 24, 26, 28, 30, 32, and 34. The system 10 further includes an interconnect arrangement 36 which connects the loads to the sources” ([20]). “As a result from the foregoing, anyone of the power sources 24, 26, 28, 10 30, 32, and 34 may fail and each of the loads 12, 14, 16, 18, 20, and 22 will remain fully powered. The power distribution system configuration of FIG. 1 hence provides reliability and continuous power to the loads. In addition, anyone power source within a single subsystem can fail and the loads will remain fully powered” ([28]). “The interconnect arrangement 36 comprises a plurality of interconnects. The interconnects connect each load to a given number of the sources so that each load is fully powered and if anyone source fails, all loads remain fully powered. To that end, it will be noted that load 12 is coupled to source 24 and source 26. Load 14 is also

coupled to source 24 and source 26. Similarly, each of loads 16 and 18 is coupled to source 28 and source 30. Also similarly, each of loads 20 and 22 is coupled to source 32 and source 34” ([26]). Moreover, the instant specification recites “[e]ach of the loads and sources may be configured for placement into a standard 19 inch rack. Further, each of the sources and loads may have a height dimension in U increments to enable efficient use of each rack” ([39]).

VI. Grounds of Rejection to Be Reviewed on Appeal

1. Claims 1-3, 6-8 and 12-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,153,946 by Koch et al., hereinafter referred to as “Koch,” in view of U.S. Patent Application Publication No. 2004/0228087 by Coglitore, further in view of U.S. Patent No. 5,861,684 by Slade et al., hereinafter referred to as “Slade.”

VII. Argument

1. Whether Claims 1-3, 6-8 and 12-17 are unpatentable by Koch in view of Coglito, further in view of Slade, under 35 U.S.C. §103(a).

According to the Final Office Action mailed April 10, 2009, hereinafter referred to as the “instant Office Action,” Claims 1-3, 6-8 and 12-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,153,946 by Koch et al., hereinafter referred to as “Koch,” in view of U.S. Patent Application Publication No. 2004/0228087 by Coglito, further in view of U.S. Patent No. 5,861,684 by Slade et al., hereinafter referred to as “Slade.” Appellants have reviewed Koch, Coglito and Slade and respectfully submit that the embodiments recited in Claims 1-3, 6-8 and 12-17 are patentable over Koch in view of Coglito, further in view of Slade, for at least the following rationale.

Appellants respectfully direct the Examiner to independent Claim 1 that recites that an embodiment of the present invention is directed to (emphasis added):

A power distribution system comprising:
one or more loads, each load operable to be mounted in a rack location;
a plurality of power sources, each power source having a capacity less than each load and operable to be mounted in a rack location not having a load;
and
an interconnect arrangement including a plurality of interconnects, the interconnects directly connecting each load to each of the sources in parallel such that each load is fully powered and if anyone source fails, each load remains fully powered.

Independent Claims 13 and 14 recite similar embodiments. Claims 2, 3, 6-8, 12 and 15-17 that depend from independent Claim 1 also include this embodiment.

“As reiterated by the Supreme Court in *KSR*, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383

U.S. 1, 148 USPQ 459 (1966). Obviousness is a question of law based on underlying factual inquiries” including “[a]scertaining the differences between the claimed invention and the prior art” (MPEP 2141(II)). “In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious” (emphasis in original; MPEP 2141.02(I)). Appellants note that “[t]he prior art reference (or references when combined) need not teach or suggest all the claim limitations, however, Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art” (emphasis added; MPEP 2141(III)).

Appellants respectfully submit that “[i]t is improper to combine references where the references teach away from their combination” (emphasis added; MPEP 2145(X)(D)(2); *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)). Appellants respectfully note that “[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention” (emphasis in original; MPEP 2141.02(VI); *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)). Appellants respectfully submit that there is no motivation to combine the teachings of Koch and Slade, because Koch teaches away from the suggested modification.

First, Appellants respectfully submit that Koch teaches away from “a plurality of power sources, each power source having a capacity less than each load and operable to be mounted in a rack location not having a load” (emphasis added) as recited in independent

Claims 1 and 14, and the similar recitation of independent Claim 13, and that Koch teaches away from the suggested modification and combination with Slade.

Appellants respectfully note that the instant Office Action recites that “Koch, however, does not disclose expressly ... each power source having a capacity less than each load, and interconnects connecting each load to each of the sources in parallel” (emphasis added; instant Office Action, page 3, lines 1-5). Appellants understand the instant Office Action to assert that Slade overcomes this shortcoming. In particular, Appellants understand the instant Office Action to assert that Slade discloses that “each of the sources has a capacity less than the load,” and that such a disclosure overcomes this shortcoming of Koch.

Appellants understand Koch to disclose “[i]n one embodiment, redundancy is provided by an extra power supply in a power supply segment. In another embodiment, redundancy is provided by the excess capacity present in the remaining power supplies in a ring when one power supply in the ring fails” (emphasis added; col. 3, lines 19-23).

Appellants note that Koch discloses that “[i]n a first embodiment, a redundant power supply is provided at the ‘top’ of a redundant power segment, with one or more computer devices coupled “beneath” the redundant power supply. If the power supply of any device fails, that device ‘borrows’ power from the device immediately upstream in the redundant power segment. If the power supply of the device immediately upstream in the redundant power segment no longer has sufficient capacity to power its own circuits, that device borrows power from the device immediately upstream from it” (emphasis added; col. 2, lines 1-11).

Accordingly, Appellants understand this embodiment of Koch to disclose that in the event of a failure of a power supply for a device, a redundant power supply, e.g., redundant power supply 12 of FIG. 1A, is operable to provide power to the device, either directly or through a propagation of power through connected devices. In particular, Appellants respectfully submit that Koch specifically discloses that each power supply, including the redundant power supply, is operable to provide at least as much power that is needed for a particular device.

Moreover, Koch discloses that “[i]n a second embodiment of the invention, a plurality of devices are coupled into a ring to provide redundant power for each other. When a power supply in the ring fails, the excess capacities of the remaining power supplies provide power for all the devices” (emphasis added; col. 2, lines 23-27). Therefore, Appellants respectfully submit that Koch specifically discloses that each power supply is operable to provide at least as much power that is needed for a particular device.

Therefore, by disclosing that each power supply of Koch, including the redundant power supply, must have at least as much power required to power at least one device of Koch, Appellants respectfully submit that Koch teaches away from “a plurality of power sources, each power source having a capacity less than each load and operable to be mounted in a rack location not having a load” (emphasis added) as recited in independent Claims 1 and 14, and the similar recitation of independent Claim 13. Moreover, Appellants respectfully submit that these disclosures of Koch teach away from the suggested modification and combination with Slade.

Second, Appellants respectfully submit that the proposed combination of Koch and Slade would change the principle of operation of Koch, and would render Koch unsatisfactory for its intended purpose.

Appellants note that “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious” (emphasis added) (MPEP 2143.01; *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)). Moreover, “[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed amendment” (emphasis added) (MPEP 2143.01; *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)).

As presented above, Appellants understand Koch to disclose a method and system for providing redundant power to connected devices. In particular, as disclosed in Koch, each power supply must be configured to provide at least enough power to at least one connected device. In particular, Appellants respectfully submit that modifying Koch in such a manner would change the principle of operation of Koch. Moreover, Appellants respectfully submit that modifying Koch to include a power supply that provides less power than is necessary to power a device would cause the method and systems of Koch to fail. Accordingly, Appellants respectfully submit that modifying Koch would render Koch unsatisfactory for its intended purpose.

In summary, Appellants respectfully submit that the rejection of Claims 1-3, 6-8 and 12-17 is improper. In particular, Appellants respectfully submit that the rejection of Claim 1-3, 6-8

and 12-17 does not satisfy the requirements of a *prima facie* case of obviousness as Koch, Coglitore and Slade as a whole do not render the claimed embodiments obvious. In particular, Appellants respectfully submit that Koch teaches away from “a plurality of power sources, each power source having a capacity less than each load and operable to be mounted in a rack location not having a load” (emphasis added) as recited in independent Claims 1 and 14, and the similar recitation of independent Claim 13. Moreover, Appellants respectfully submit that Koch teaches away from the suggested modification and combination with Slade. Furthermore, Appellants respectfully submit that the proposed combination of Koch and Slade would change the principle of operation of Koch, and would render Koch unsatisfactory for its intended purpose.

Appellants note that the Response to Arguments section of the instant Office Action states that “Slade is being used for the teaching of providing power to a load from a source that has capacity less than the load” (instant Office Action; page 10, lines 16-17. Appellants understand this assertion to address the argument that Koch teaches away from “a plurality of power sources, each power source having a capacity less than each load” as claimed. As presented above, Appellants note that “[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention” (emphasis in original; MPEP 2141.02(VI); *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)). Appellants respectfully submit that Slade does not overcome the deficiencies of Koch because Koch teaches away from the suggested modification.

Appellants respectfully assert that Koch, Coglitore and Slade does not render obvious the claimed embodiments of the present invention as recited in independent Claims 1, 13 and

14, that these claims overcome the rejection under 35 U.S.C. § 103(a), and that these claims are thus in a condition for allowance. Therefore, Appellants respectfully submit that Koch, Coglitore and Slade also does not render obvious the claimed embodiments as recited in Claims 2, 3, 6-8, 12 and 15-17 that depend from independent Claim 1 also overcome the rejection under 35 U.S.C. § 103(a), and are in a condition for allowance as being dependent on an allowable base claim.

Conclusion

Appellants believe that pending Claims 1-3, 6-8 and 12-17 are patentable over the asserted art as the rejections of Claims 1-3, 6-8 and 12-17 under 35 U.S.C. §103(a) do not satisfy the requirements of a *prima facie* case of obviousness.

Accordingly, Appellants respectfully submit that the rejections of Claims 1-3, 6-8 and 12-17 are improper and should be reversed.

The Appellants wish to encourage the Examiner or a member of the Board of Patent Appeals to telephone the Appellants' undersigned representative if it is felt that a telephone conference could expedite prosecution.

Respectfully submitted,
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Dated: 08/10/2009

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VIII. Appendix - Clean Copy of Claims on Appeal

1. A power distribution system comprising:
 - one or more loads, each load operable to be mounted in a rack location;
 - a plurality of power sources, each power source having a capacity less than each load and operable to be mounted in a rack location not having a load; and
 - an interconnect arrangement including a plurality of interconnects, the interconnects directly connecting each load to each of the sources in parallel such that each load is fully powered and if anyone source fails, each load remains fully powered.
2. The power distribution system of claim 1 wherein all of the sources are DC sources.
3. The power distribution system of claim 1 wherein all of the sources are AC sources.
6. The power distribution system of claim 1 wherein the one or more loads, the plurality of power sources and the interconnect arrangement together comprise a power distribution subsystem, wherein the one or more loads includes a 4X watt load, wherein the plurality of sources include first, second, and third 2X watt sources, and wherein the interconnect arrangement includes interconnects that connect the 4X watt load to each of the first, second, and third 2X watt sources, X having a numeric value.
7. The power distribution system of claim 1 wherein the one or more loads, the plurality of power sources and the interconnect arrangement together comprise a power distribution subsystem, wherein the one or more loads includes a 5X watt load, wherein the

plurality of sources include first, second, third, fourth, fifth, and sixth 2X watt sources, and wherein the interconnect arrangement includes interconnects that connect the 5X watt load to each of the first, second, third, fourth, fifth, and sixth 2X watt sources, X having a numeric value.

8. The power distribution system of claim 1 wherein the one or more loads includes a 10X watt load, wherein the plurality of sources include first, second, third, fourth, fifth, and sixth 2X watt sources, and wherein the interconnect arrangement includes interconnects that connect the 10X watt load to each of the first, second, third, fourth, fifth, and sixth 2X watt sources, X having a numeric value.

12. The power distribution system of claim 1 wherein the one or more loads includes an 8X watt load, wherein the plurality of sources include first, second, and third 4X watt sources, and wherein the interconnect arrangement includes interconnects that connect the 8X watt load to each of the first, second, and third 4X watt sources, and wherein the interconnect arrangement includes interconnects that connect the 8X watt load to each of the first, second, and third 4X watt sources, X having a numeric value.

13. A power distribution system comprising:
a plurality of loads, each load operable to be mounted in a rack location;
a plurality of power sources, the power sources having a collective capacity to fully power all of the loads and each power source having a capacity less than each load and operable to be mounted in a rack location not having a load; and

an interconnect arrangement including a plurality of interconnects, the interconnects directly connecting each load to each of the sources in parallel such that each load is fully powered notwithstanding failure of anyone of the sources.

14. A method of distributing full power to each one of a plurality of loads, each load operable to be mounted in a rack location, the method comprising:

providing a plurality of power sources, each power source having a capacity less than each load and operable to be mounted in a rack location not having a load, the power sources being sufficient in number and capacity such that a combination of less than all of the sources is sufficient to power each load; and

directly connecting each load to each of the sources in parallel such that if anyone source fails, each of the loads remains fully powered.

15. The power distribution system of claim 1 wherein the one or more loads include first and second 5X watt loads, wherein the plurality of sources include first, second, third, fourth, fifth, and sixth 2X watt sources, and wherein the interconnect arrangement includes interconnects that connect the first 5X watt load to each of the first, second, third, fourth, fifth, and sixth 2X watt sources and the second 5X watt load to each of the first, second, third, fourth, fifth, and sixth 2X watt sources, X having a numeric value.

16. The power distribution system of claim 1 wherein the number of sources is three-times the number of loads.

17. The power distribution system of claim 1 wherein the number of sources is six-times the number of loads.

IX. Evidence Appendix

No evidence is herein appended.

X. Related Proceedings Appendix

No related proceedings.